0120950

DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES

AIR QUALITY BUREAU

TED SCHWINDEN, GOVERNOR

COGSWELL BUILDING

STATE OF MONTANA

(406) 444-3454

HELENA, MONTANA 59620

October 13, 1987

RTE.	ACT.	ACC.
JeH	cc	
BR	cc	✓
BR	FILE	10/13
TECH	ADM	ENF

EAST HELENA LEAD

Jay Sinnott
Montana Operations Office
Environmental Protection Agency
301 S. Park, Drawer 10096
Helena, MT 59626

Dear Mr. Sinnott:

The time has arrived to evaluate the progress made toward achieving the state and federal lead ambient standards within East Helena. Therefore, I have scheduled a meeting for 1:15 p.m., October 29, 1987, in Room A110 of the Cogswell Building to discuss the matter. Please note the room change from what I mentioned on the telephone.

As you are aware, the department submitted to EPA a revised State Implementation Plan (SIP) for East Helena in September, 1983. The revised SIP contained an emission control plan to achieve compliance with the ambient air quality standards for lead by December 31, 1986. I am happy to say that all of these control strategies were implemented on schedule.

Unfortunately, the ambient air quality data from East Helena continued to show exceedances of the standards during the first two quarters of 1987. Therefore, it is imperative that the appropriate parties come together and discuss the current SIP status and the possible implementation of additional control strategies.

I have enclosed an agenda for the meeting as well as summaries of the 1987 ambient data and chemical mass balance results. Also enclosed is a copy of the existing East Helena lead SIP.

The department looks forward to once again working with you on this challenging problem. Thank you.

Sincerely,

Bob Raisch, Supervisor
Air Toxics and Planning

BR:kh

Enclosures

0120951

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HELENA, MONTANA 59620

October 13, 1987

William H. Porter
American Chemet
P. O. Drawer D
East Helena, MT 59635

Dear Mr. Porter:

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STATE OF MONTANA

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HELENA, MONTANA 59620

October 13, 1987

John Blacker
~~c/o Don Gruel, Administrator~~
Maintenance & Equipment Div.
Department of Highways
Helena, MT 59620 ← Fairgrounds

Dear Mr. Blacker:

The time has arrived to evaluate the progress made toward achieving the state and federal lead ambient standards within East Helena. Therefore, I have scheduled a meeting for 1:15 p.m., October 29, 1987, in Room A110 of the Cogswell Building to discuss the matter. Please note the room change from what I mentioned on the telephone.

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Air Toxics and Planning

BR:kh

Enclosures

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(406) 444-3454

HELENA, MONTANA 59620

October 13, 1987

Larry Moore, Mayor
City of East Helena
East Helena, MT 59635

Dear Mr. Moore:

The time has arrived to evaluate the progress made toward achieving the state and federal lead ambient standards within East Helena. Therefore, I have scheduled a meeting for 1:15 p.m., October 29, 1987, in Room A110 of the Cogswell Building to discuss the matter. Please note the room change from what I mentioned on the telephone.

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The department looks forward to once again working with you on this challenging problem. Thank you.

Sincerely,

Bob Raisch, Supervisor
Air Toxics and Planning

BR:kh

Enclosures

0120354

DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES

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TED SCHWINDEN, GOVERNOR

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STATE OF MONTANA

(406) 444-3454

HELENA, MONTANA 59620

October 13, 1987

Jon Nickel
ASARCO, Inc.
East Helena Plant
East Helena, MT 59635

Dear Mr. Nickel:

The time has arrived to evaluate the progress made toward achieving the state and federal lead ambient standards within East Helena. Therefore, I have scheduled a meeting for 1:15 p.m., October 29, 1987, in Room A110 of the Cogswell Building to discuss the matter. Please note the room change from what I mentioned on the telephone.

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Sincerely,

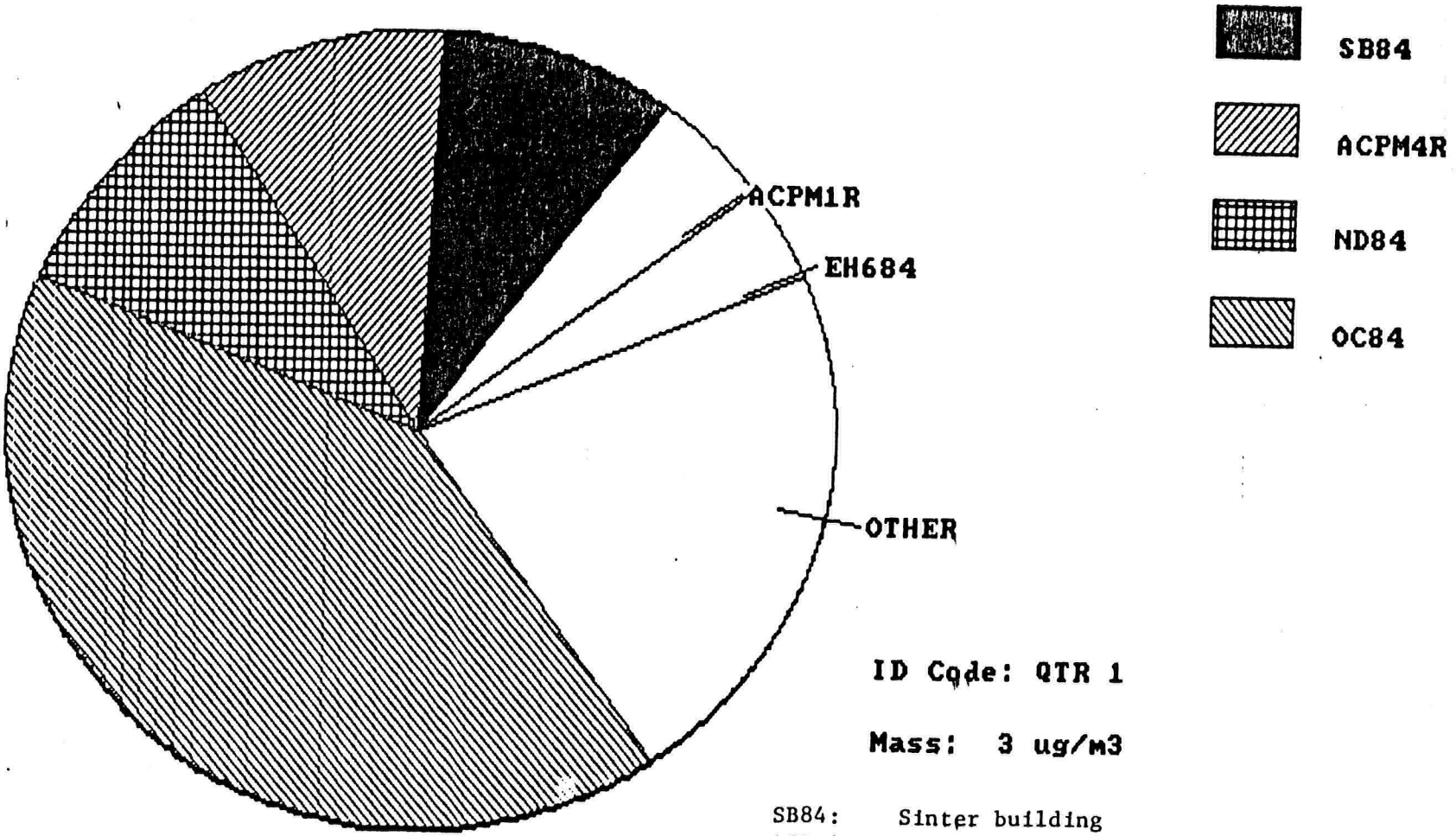
Bob Raisch, Supervisor
Air Toxics and Planning

BR:kh

Enclosures

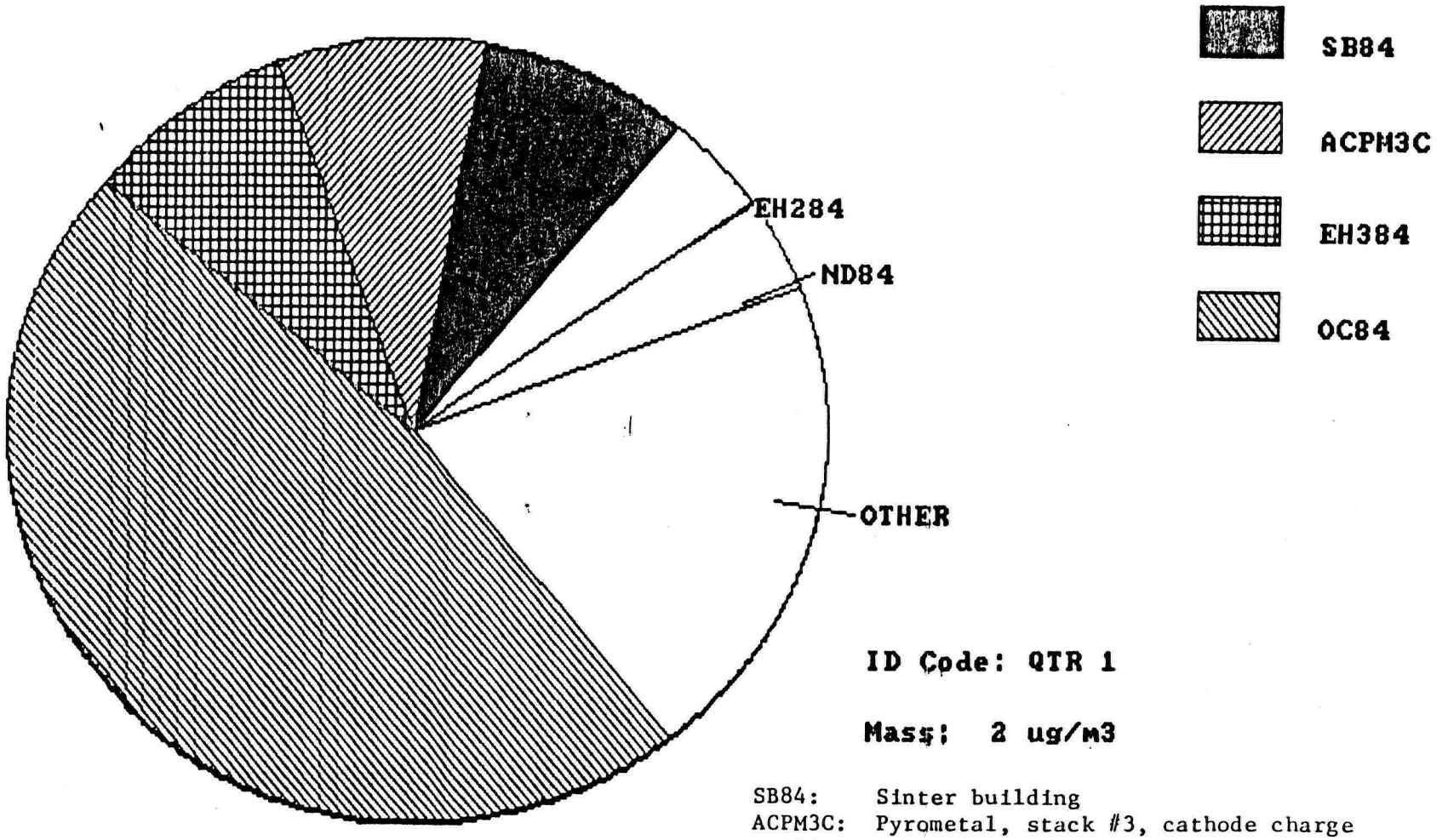
cc: Mel Sharp

2.2.3 HADFIELD AVERAGE FIRST QUARTER LEAD PIE CHART



SB84: Sinter building
ACPM4R: Pyrometal, stack #4, regular charge
ND84: Ore blending, New Deal building
OC84: Ore composite, 1984 samples
ACPM1R: Pyrometal, stack #1, regular charge
EH684: Main St. at Hadfield road dust

1.2.3 FIREHALL AVERAGE FIRST QUARTER LEAD PIE CHART



ID Code: QTR 1

Mass: 2 ug/m3

SB84:	Sinter building
ACPM3C:	Pyrometal, stack #3, cathode charge
EH384:	Pacific St. at Firehall road dust
OC84:	Ore composite, 1984 samples
EH284:	Firehall parking lot dust
ND84:	Ore blending, New Deal building

1987 EAST HELENA LEAD DATA
Quarterly Averages
(ug/m^3)

Quarter	Pollutant	Firehall	Hadfield	Dartman
1st	TSP	73.5	82.4	47.8
	Cu	7.6		
	Pb	3.4	3.4	2.5
	Zn	1.7		
2nd	TSP	60.7	63.1	40.5
	Cu	5.5		
	Pb	2.3	1.9	1.3
	Zn	1.2		

LEAD

1. Introduction

Section 110 of the federal Clean Air Act requires each state to submit an implementation plan for the control of each air pollutant for which national ambient air quality standards have been established. On October 5, 1978, the United States Environmental Protection Agency (EPA) promulgated an ambient air quality standard for lead. The standard is 1.5 micrograms per cubic meter of air averaged over a calendar quarter. Each state must submit a plan within nine months of the EPA promulgation. EPA must act to approve or disapprove a proposed state plan within four months of submission. The plan must demonstrate compliance with the lead standard within three years of EPA's approval, except that an additional two-year extension may be granted at the Administrator's discretion.

The Montana plan for the control of lead in the atmosphere has been prepared for submission to EPA in accordance with Section 110 of the Clean Air Act and EPA regulations located at 40 CFR Part 51. The plan outlines how Montana intends to achieve compliance with the ambient lead standard within three years after EPA's approval.

2. General Discussion

40 CFR §51.80 requires that each plan must demonstrate that the ambient standard will be attained and maintained in the following areas:

(1) Areas in the vicinity of certain specified types of point sources including primary lead smelters, or in the vicinity of any other stationary source that actually emits 25 or more tons of lead or lead compounds per year;
(2) Any other area that has lead concentrations in excess of the national ambient air quality standard measured since January 1, 1974.

Montana has one such area: The area in the vicinity of the ASARCO lead smelter in East Helena. Montana has no other areas with smelters or other point sources qualifying under the EPA regulations.

A review has been conducted of all ambient lead data collected in Montana since January 1, 1974. Approximately two years of data is available for most of the major population centers from 1978 to 1980. Table 5-L-1 is a summary of this data:

TABLE 5-L-1

AMBIENT LEAD CONCENTRATIONS
FOR MONTANA CITIES

Year	Quarter	Anaconda Lincoln Sc.	Butte Hebgen Park	Billings Central Park	Missoula Courthouse Roof
1978	3	0.29*	0.31	0.35*	0.30
1978	4	0.64	0.62	0.48	0.53
1979	1	0.36	0.44	0.30	0.41*
1979	2	0.14	0.19	0.18	0.18
1979	3	0.34	0.28	0.23	0.22
1979	4	0.39	0.46	0.36	0.35
1980	1	0.21	0.31	0.22	0.24

*Not enough data to constitute a valid quarterly mean

Note: The analysis method varied slightly from that required by 40 CFR Part 50, Appendix G. The data is believed to be generally accurate, although it may slightly underestimate the actual levels.

Therefore, the core of the plan establishes a control strategy for attaining and maintaining the ambient lead standard only in the East Helena area.

A. Compliance with the standard for new sources

In addition to addressing the controls for the East Helena area, Montana must also demonstrate its ability to continue to maintain the air quality standards throughout the rest of the state. Montana plans to do this through its new source review and PSD regulations. The Administrative Rules of Montana (ARM) Title 16, Chapter 8, Sub-chapter 11 contain the provisions for all new or altered sources of air pollution. Any source whose potential to emit exceeds 25 tons per year of any air pollutant is regulated pursuant to the Montana Clean Air Act (which includes an ambient air standard for lead of 1.5 ug/m^3 90-day average). If a source were to propose construction, it would be required to install Best Available Control Technology (ARM 16.8.1103) even though it may not be a PSD source. The BACT requirement and ARM 16.8.1109 allow the Department to add conditions to permits in order to meet all applicable rules and standards.

In addition to the new source review requirements discussed above, Montana has received authorization for the PSD, NSPS, and NESHAPS programs. ARM Title 16, Chapter 8, Sub-Chapter 14 contains other general emission limitations requirements for fugitive emission sources. All of these regulations in concert will assure continued compliance with the ambient air quality standards for lead.

B. Source Apportionment Approach

Several methods are available in order to determine an appropriate control strategy. The most commonly used methods in the past have been dispersion modeling and the modified roll-back model. EPA regulations [40 CFR §51.2(c) and (e)] allow the use of alternative techniques when adequate and appropriate. The Department has opted to utilize a receptor model. The particular method used is chemical mass balance (CMB) analysis. Although the method is relatively new, it has been used with good success in other areas. This method is especially useful here since most of the lead sources in the East Helena area are fugitive in nature. Dispersion techniques are generally poor at predicting fugitive emission effects since the emission factors are quite difficult to measure. The CMB approach does not rely on emission factors, but rather on the qualitative nature of the emissions (ratios of iron, lead, zinc, and so forth). The ambient filters are analyzed to determine which source has the same composition as the particulate on the filter, so that measured ambient levels are matched with specific sources.

C. Ad Hoc Committee

Since the sources of lead in East Helena are many and varied, it was decided to form an ad hoc committee to develop and review this lead implementation plan prior to the required public hearing and presentation to the Montana Board of Health and Environmental Sciences. The committee was informal and consisted of members of the Department, ASARCO, American Chemet, Montana Highway Department, and the City of East Helena. The committee met approximately monthly from November 1982 until the plan was finally submitted to the Board for adoption.

3. Air Quality Data

Air quality data for most of the state is summarized in the preceding section. Air quality data for the East Helena area is described in more detail in this section.

The Department has operated a lead sampling program in the East Helena area since 1977. However, only the monitor at the Hastie residence at 212 Pacific Street operated continuously over the entire period. During the fall of 1980 and throughout 1981, the Department and ASARCO dramatically increased the lead monitoring network around East Helena. Table 5-L-2 contains a summary of the East Helena ambient lead data compiled by the Department.

TABLE 5-L-2

EAST HELENA QUARTERLY LEAD CONCENTRATIONS
ug/m^3

	Jan-Mar	April-June	July-Sept	Oct-Dec
		HASTIES RESIDENCE		
1977	4.69	2.76	*2.25	10.80
1978	4.01	4.38	*4.46	4.29
1979	*4.18	2.22	2.44	4.10
1980	2.60	1.45	2.74	2.72
1981	3.19	1.60	2.33	2.51
		MICROWAVE		
1977	0.65	0.67	0.27	1.30
1978	0.98	0.23	0.27	0.52
1979	1.13*	0.23	0.19	---
		A&W		
1980	0.77	0.26*	0.76	1.19
1981	0.51	0.40	0.42	0.49
		CANAL		
1981	0.91	0.76	0.77	1.09
		VOLLMER		
1981	0.66*	0.42	0.69	1.27
		SOUTH		
1981	---	---	1.40	0.94
		FIREHALL		
1981	5.77**	2.88*	----	----
		PADBURY		
1981	---	---	0.15	0.27
		VALLEY BANK (Helena)		
1981	0.31	0.03	0.14	0.27*
		DARTMAN		
1981	----	---	---	1.28
		HADFIELD		
1981	----	---	*4.98	2.27

*Insufficient data to establish a valid quarterly mean
**Represents a running 90-day mean (sampler did not begin operation until three weeks into quarter)

The new sampling sites established during late 1980 and 1981 were located through the analysis of data from (1) past lead sampling, (2) lead concentrations in snow samples, and (3) dispersion modeling. Figure 5-L-1 is a map of the East Helena area showing monitoring site locations. Figure 5-L-2 shows isopleths of lead concentrations in snow samples. Figure 5-L-3 shows isopleths of lead concentrations in the air as predicted by a dispersion model of ASARCO stack emissions. Figure 5-L-4 shows isopleths of lead concentrations in air as predicted by a dispersion model of ASARCO-stack and process fugitive emissions, other fugitives and vehicular tailpipe and re-entrained emissions. These modeling efforts were conducted in 1980 by ETA of Westmont, Illinois, and utilized the VALLEY model.

Although the results from the snow sampling and dispersion modeling differ in many respects, they both show peak concentrations in three areas: (1) near the smelter, (2) in an area approximately 1.0 to 1.5 miles southeast of the smelter (stack emissions), and (3) in an area approximately 1.0 mile south of the smelter (stack emissions). The snow sample data indicated that these peaks were closer to the smelter than the model predicted.

The Microwave and South sites were intended to sample the predicted high concentration area south of the plant, while the Vollmer site was chosen as the best practical site to sample the predicted southeastern concentration peak. The A&W, Hastie, and Hadfield sites were located to determine lead impacts on the population of East Helena, as well as to monitor an area of high lead concentrations as predicted by snow sampling data. The Padbury and Valley Bank sites serve as background since they are located generally upwind of the smelter. The Canal site was chosen based on the results of the dispersion modeling of process and other fugitive emissions.

The results of the lead monitoring program (Table 5-L-2) indicate that violations of the 1.5 ug/m^3 quarterly standard exist in an area extending north of the ASARCO smelter into East Helena. Quarterly violations were observed at the Dartman, Hastie, Firehall, and Hadfield sites. The Hastie site has shown lead concentrations greater than 1.5 ug/m^3 over its entire five-year history, with a reduction occurring in 1980 and 1981. The South site .5 mile southeast of the smelter registered quarterly averages close to the lead standard and in the third quarter of 1982 exceeded the standard with a 1.53 ug/m^3 average. No violations of the lead standard have been recorded at any of the other monitoring sites.

The development of a lead SIP requires modeling to verify the geographical extent of violations observed during the monitoring project. The modeling described above satisfies this requirement. Additional modeling is unnecessary for the following reasons:

1. The extensive lead monitoring network used during 1980 and 1981 has adequately described lead concentrations throughout the East Helena area.

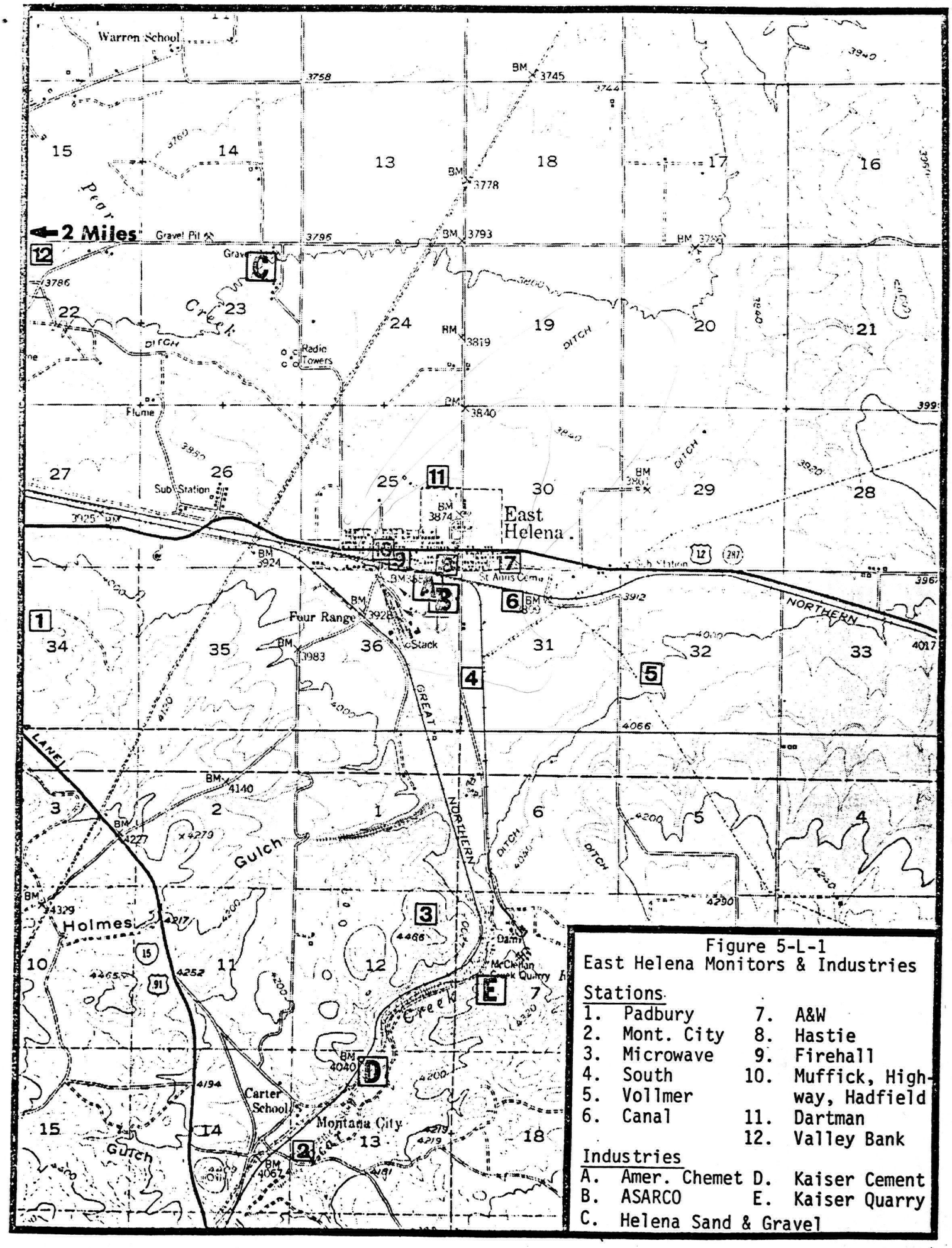


Figure 5-L-1
East Helena Monitors & Industries

Stations

1. Padbury
2. Mont. City
3. Microwave
4. South
5. Vollmer
6. Canal
7. A&W
8. Hastie
9. Firehall
10. Muffick, Highway, Hadfield
11. Dartman
12. Valley Bank

Industries

A. Amer. Chemet
B. ASARCO
C. Helena Sand & Gravel
D. Kaiser Cement
E. Kaiser Quarry

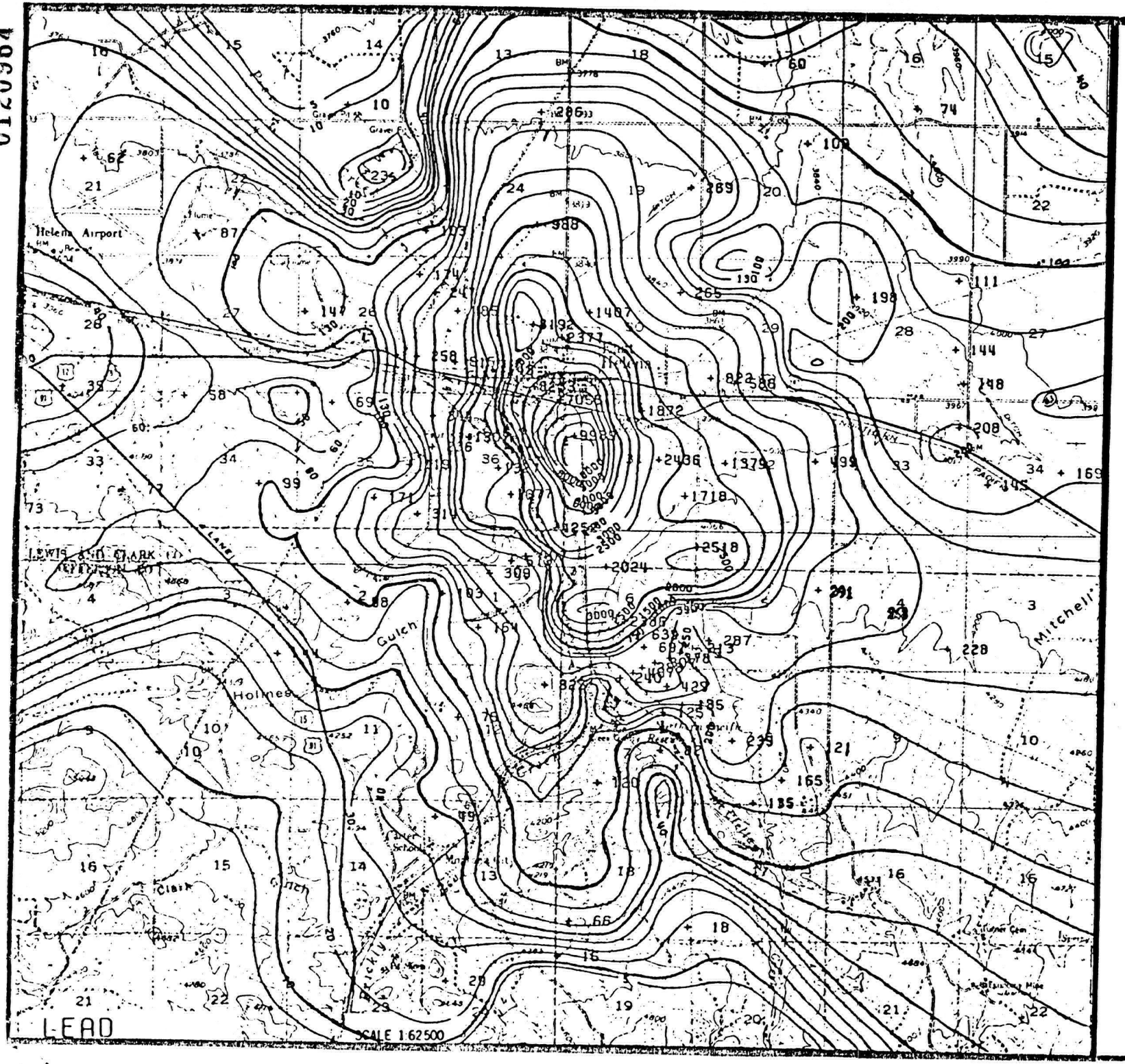


Figure 5-L-2

East Helena
Snow Survey

Lead Concentrations
(Micrograms/core)

Core=3.65 in^2

Figure 5-L-3

East Helena

Annual Lead Concentrations
(10^{-4} micrograms/cubic meter)

Summation of Main Stack, Zinc Stack,
and Baghouse Stacks.

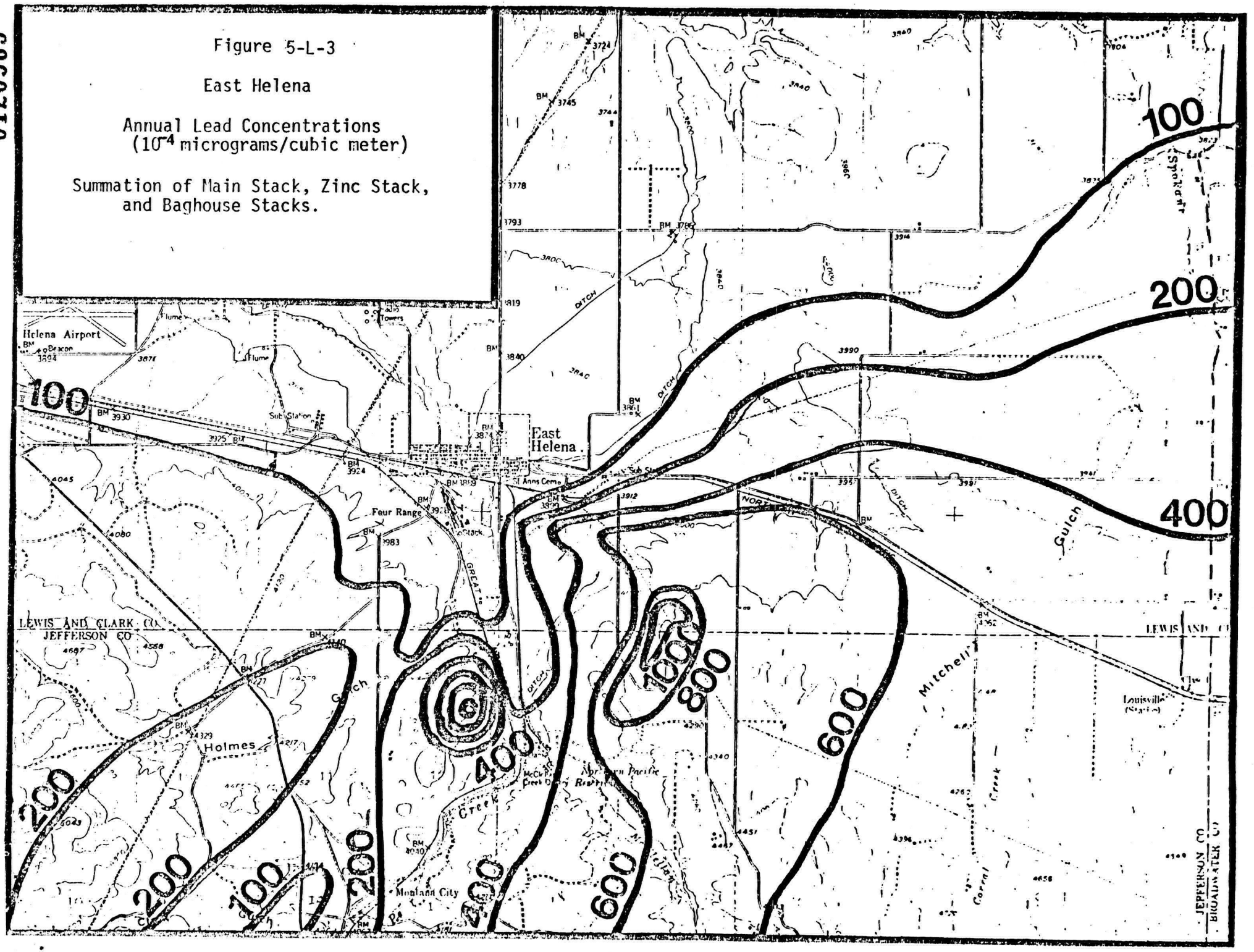
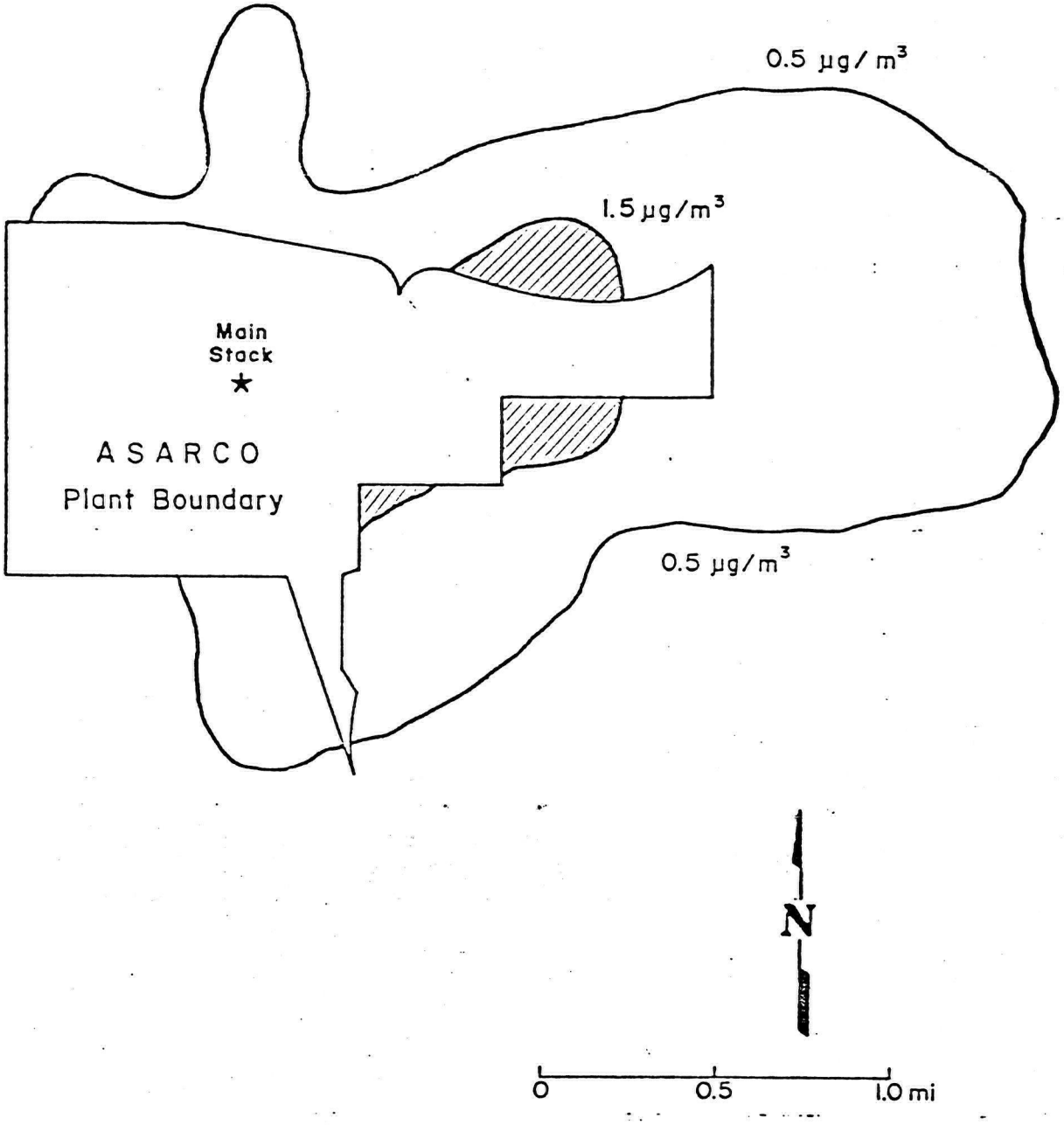


Figure 5-L-4



PREDICTED LEAD CONCENTRATIONS*

EAST HELENA - 4th QUARTER 1978

(TOTAL OF ALL SOURCES)

* Background not included

2. The snow sampling data appears to have reliably predicted areas of high ambient lead concentrations within the City of East Helena when compared with ambient monitoring data. Since the Department will continue to monitor at these "hot spots", compliance there should assure compliance over the entire area.

3. The Valley model utilized by ETA did not perform well in predicting ambient concentrations. Although a more detailed modeling effort might be initiated with better inputs, it is questionable that better results would be attained. In addition, the Department has monitored in all areas predicted to have high lead concentrations by the model and found them to be in compliance with the ambient standard.

The Department has submitted all ambient lead data to EPA in accordance with EPA requirements every quarter for the past four years. This submission satisfies the requirements of 40 CFR §51.86.

4. Emissions Data

EPA regulations (40 CFR §51.81) require that the plan include a summary of a baseline emission inventory based upon measured emissions, or where measured emissions are not available, documented emission factors. This plan is not based upon a detailed emission inventory for the following reasons.

As explained in Sections 2 and 5 of this plan, the primary method of source apportionment, and therefore control strategy development was not a dispersion or roll-back model. A chemical mass balance (CMB) source receptor model was chosen. The use of this model does not require knowledge of the quantity of emissions from any of the identified sources (the CMB model defined 79 distinct sources). Therefore, it was not necessary to make a detailed compilation of emissions. The CMB method does, however, distinguish all the important sources of lead and their relative contribution to each sampler for each quarter of the year. This ability to define source contribution by space and time effectively supplants any need for an emissions inventory.

Lead emissions are not expected to increase during the three-year period following EPA approval of this plan. With implementation of the control strategy described in Section 6, emissions are projected to decrease to achieve compliance with the lead standard. The basis for this projection is discussed in connection with the demonstration of attainment in Section 6.

5. Monitoring Plan and Source Apportionment

A. Monitoring Plans

The primary monitoring conducted for the preparation of this plan occurred in 1981. A total of ten sites were used in the analysis of compliance with the ambient air quality standards. Section 3 of this plan describes the location of the monitors and summarizes the data obtained from them. Ambient data has already been submitted to EPA in standard SAROAD output to the Regional Office.

Long-term monitoring will be conducted. It will include all monitors that have shown past violations. Other monitors may be added following the outcome of the yearly network review and in accordance with EPA monitoring guidelines. The current monitoring sites are Firehall, Hastie, Hadfield, South and Dartman.

B. Source Apportionment

A chemical mass balance (CMB) source apportionment was utilized to determine the sources of particulate lead in the East Helena area. This method was chosen over roll-back and dispersion modeling since it is considered to be a more accurate method of apportioning sources from existing operations. In addition, the emission factors for fugitive sources are of low quality and since both the roll-back and dispersion method require accurate emission factors, those two methods were rejected.

The CMB work was performed by NEA, Inc. and was commenced during 1981. The source measurement techniques were carried out in November of 1981 with the final report completed near the end of 1982. All of the control strategies in this plan are a result of the determinations made by the CMB analysis. The CMB method is described in the NEA report. (Copies of the report have already been made available to EPA.)

Table 5-L-3 summarizes the source contributions to ambient lead at several of the monitoring locations.

CMB analysis will continue to be used to track the progress of the various control strategies. Based on these results, the Department may, if appropriate, request modifications to the plan to reflect this data.

Table 5-L-3

SOURCE APPORTIONMENT RESULTS 1981

Source	Monitoring Locations: Calendar Quarter:	Firehall 1*	Firehall 2*	Hadfield 3*	Hadfield 4	Hastie 4	Highway 4
Road and Soil Dust		19%	36%	33%	54%	20%	43%
Ore Handling and Concentrate Dust		35%	0%	24%	0%	0%	18%
Blast Furnace (Upset)		26%	40%	27%	33%	33%	23%
Zinc Oxide Material (ASARCO)		9%	15%	6%	6%	41%	5%
Dross Building Emissions		4%	3%	5%	3%	1%	5%
Vehicle Exhaust (leaded gasoline)		4%	5%	5%	5%	5%	5%
Copper Kiln (American Chemet)		0%	1%	0%	0%	0%	2%
Slag Pouring		2%	0%	0%	0%	0%	0%

*Data quantity sufficient to constitute a valid calendar quarterly average

6. Control Strategy and Compliance Schedule

The control strategy set forth below is based upon the ambient air quality data and upon the CMB analysis of source contributions described hereinabove. More specifically, alternative control strategies have been formulated to achieve and demonstrate compliance based upon alternative worst-case 1981 ambient lead 90-day average concentrations (ug/m^3), namely, (1) Hastie monitor, 4th quarter, 2.51 and Hadfield, 4th quarter 2.27, or (2) Firehall, 1st quarter, 5.77.

The CMB analysis was used to attribute a quantitative percentage of the lead collected on ambient receptors to each of several identified sources of lead emissions. The general categories of lead emission sources identified are tabulated in Table 5-L-3. The attainment demonstrations are based upon the aforesaid three ambient averages from 1981 and therefore the source apportionment percentages with alternative control strategies as appropriate for the applicable quarter of 1981 are also used. The only difference at this time in the control strategies pertains to the blast furnaces, as more fully explained hereinbelow.

Table 5-L-4 summarizes the attainment demonstrations based upon the 1981 data and source apportionment. For each source, the table sets forth the control percentage resulting from the control strategy provided herein and sets forth the amount of lead remaining from each source after application of controls. The control strategies and compliance dates which form the basis for this attainment demonstration are discussed below:

A. Road and Soil Dust

As a prelude to the design of the SIP and in conjunction with the impact and control of road and soil fugitive emissions, the Department had Midwest Research Institute (MRI) evaluate various control techniques to deal with lead emissions from these sources. The Department has incorporated the control measures which it deems necessary to attain compliance.

(1) The unpaved shoulders of Pacific Street from 1st Street to Montana Avenue and the alley between Smith's Bar and Firehall in East Helena are to be paved by ASARCO by chip and seal paving.

(2) Highway 518 beginning at Main Street and extending south to Montana City is to be chip-sealed by the State Highway Department.

(3) All paved streets within East Helena south of Riggs Street between 1st Street and Montana Avenue, and South of Main Street between 3rd Street and Montana Avenue (including Riggs and Main Streets) are to be mechanically swept and flushed (refer to MRI report, page 13) periodically by the City of East Helena on a schedule to be worked out with the Department.

TABLE 5-L-4

CONTROL STRATEGY DEMONSTRATION

Hastie Site - 4th Quarter 1981

Source	Contribution(%)	(ug/m^3)	Control (%)	Controlled
Road and soil dust	20	.50	65	.18
Ore Concentrates and Fugitives	0	0	70	0
Blast Furnace	33	.83	70	.25
Zinc Plant	41	1.03	90	.10
Dross Plant	1	.02	50	.01
Vehicle Exhaust	5	.13	90	.01
Chemet	0	0	0	0
TOTAL	100%	2.51		.55 ug/m^3

Hadfield Site - 4th Quarter 1981

Source	Contribution (%)	(ug/m^3)	Control (%)	Controlled
Road and soil dust	53	1.20	65	.42
Ore Concentrates and Fugitives	0	0	70	0
Blast Furnace	33	.75	70	.23
Zinc Plant	6	.14	90	.01
Dross Plant	3	.07	50	.04
Vehicle Exhaust	5	.11	90	.01
Chemet	0	0	0	0
TOTAL	100%	2.27		.71 ug/m^3

Firehall Site - 1st Quarter 1981

Source	Contribution (%)	(ug/m^3)	Control (%)	Controlled
Road and soil dust	18.6	1.07	65	0.375
Ore Concentrates and Fugitives	35.3	2.04	70	0.612
Blast Furnace	26.0	1.50	95	0.075
Zinc Plant	9.5	0.55	90	0.055
Dross Plant	4.5	0.26	50	0.130
Vehicle Exhaust	3.9	0.23	90	0.023
Chemet	0.2	0.01	0	0.010
Slag pouring	2.0	0.11	0	0.110
TOTAL	100%	5.77		1.390 ug/m^3

(4) Unpaved streets within East Helena, south of Main Street and West of Montana Avenue are to be chemically stabilized by ASARCO using a suitable base material inoffensive to the human senses (odor). See Figure 5-L-5.

(5) Unpaved road from railroad tracks to Moon Town is to be water sprayed or chemically stabilized as necessary by ASARCO.

(6) Paved road from ASARCO plant main gate to and across railroad tracks to Highway 12 is to be swept and water sprayed by ASARCO.

(7) ASARCO in-plant roads and parking lots are to be swept, and if appropriate, water sprayed or chemically stabilized by ASARCO.

(8) Road from railroad tracks to (and including) ore concentrate truck receiving area is to be swept and water sprayed by ASARCO.

(9) Parking lot areas between Firehall and Smith's Bar and the Kennedy Park access road and parking lot are to be paved by ASARCO.

(10) The IGA parking lot is to be paved by IGA.

(11) Memorial Park parking lot is to be resurfaced with new fresh gravel and then compacted by ASARCO.

(12) U.S. Highway 12 between junction with Main Street and Highway 518 will be swept and water flushed by the State Highway Department on an appropriate schedule to be worked out with the Department.

With respect to collected dust and soils, ASARCO shall conduct high-powered vacuum operations on:

(a) Main Street from Highway 518 to 1st Street.
(b) 1st Street from Main Street to Highway 12.
(c) Montana Avenue from Main Street to Highway 12.
(d) Morton Avenue from Main Street to Pacific Street.
(e) Pacific Street from 1st Street to Montana Avenue.
(f) The road from Highway 12 to the smelter gate and to the smelter ore concentrate truck receiving area.
(g) Cleveland Avenue from Main Street to Pacific Street.
(h) The Memorial Park playground area and also resurface with new limerock.

Compliance with all of the above conditions shall be achieved by December 31, 1983.


PAVED AREAS - GREEN
WATER SPRAYED/CHEMICALLY TREATED-BLUE
RESURFACED AREAS - RED
MOONTOWN
HIWAY 12
FIRST
CLEVELAND
MORTON
HARRISON
THURMAN
HELENA
MONTANA
HIWAY 518

FIGURE 5L5

0120974

5-88

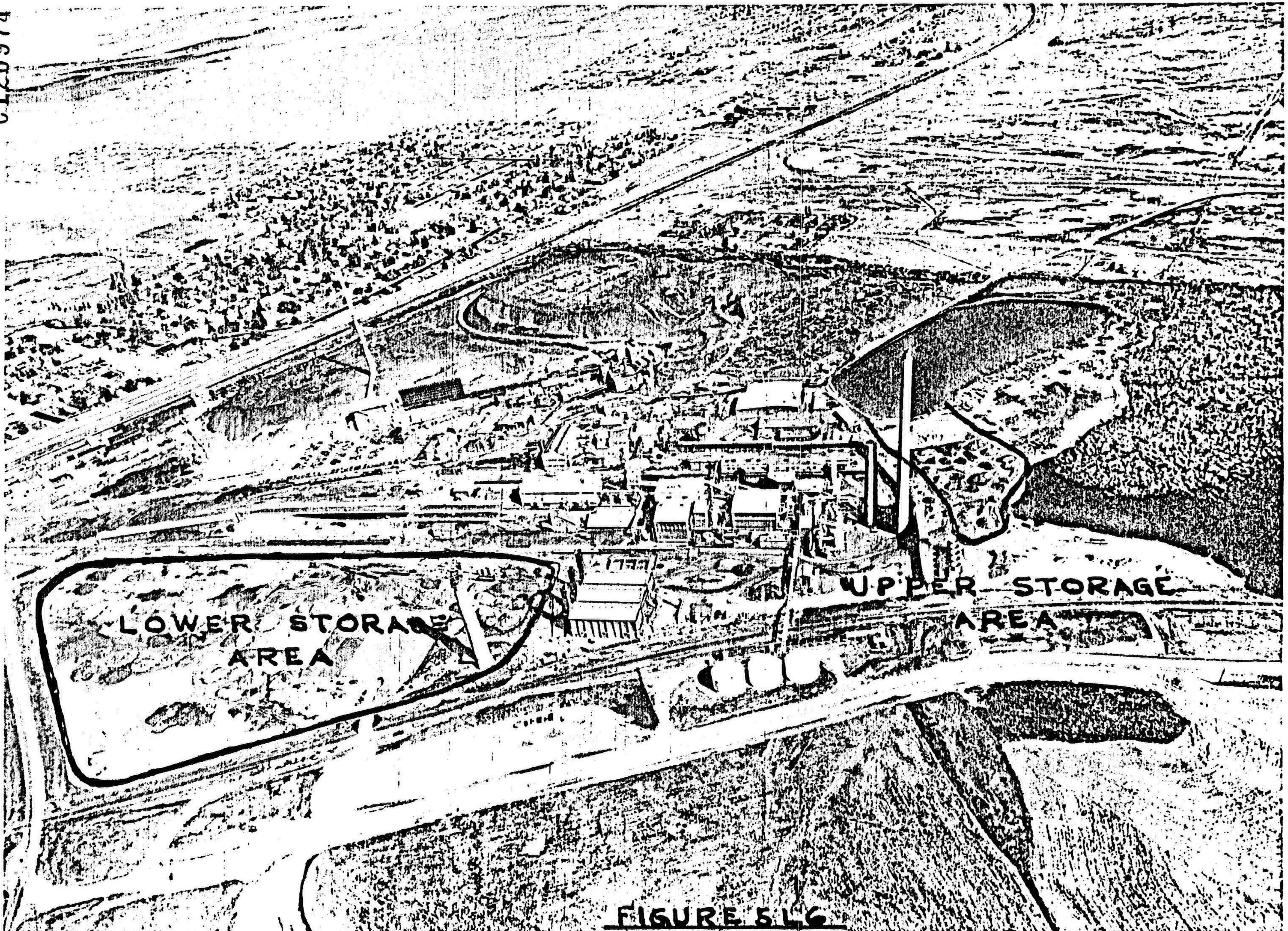


FIGURE 5L6

The overall control efficiency from the implementation of these control measures for road and soil dust is estimated to be 65 percent. This estimate is based upon a review of literature regarding fugitive dust emissions and control efficiencies and also upon information contained in the MRI report mentioned above. In order to monitor compliance with the maintenance aspects of these controls, each entity responsible for road sweeping and/or spraying shall be required to retain appropriate records pertaining to the performance of such activity.

A map depicting the areas to be resurfaced, paved or chemically treated/water sprayed is included. See Figure 5-L-5.

B. Ore Concentrates and Other Fugitive Sources within Smelter Complex

(1) All ore concentrate piles are to be chemically sealed with a suitable binder. Sealed piles which are broken into during plant operation are to be resealed as soon as practicable but no later than 24 hours after initial crust breaking.

(2) Mechanical sweeper plus chemical stabilization augmented by watering -weather permitting- shall be used on all in-plant concentrate haul roads.

(3) Concrete dividers shall be installed for separation of all stored concentrates in an effort to minimize disturbance of the piles by reason of winds or plant equipment. In addition, wind screens will be installed on these concrete dividers which will greatly reduce any possible wind impacting on the concentrates.

(4) Trees shall be planted along the west and northwest fenceline of the plant to act as a natural windbreak for the prevailing westerly and northwesterly winds.

(5) The active ore piles shall be relocated to the lower storage area of the plant in order to provide greater protection for the concentrate piles. The present upper storage area will be used for the storage of low-lead materials such as silicas and limerock. See Figure 5-L-6.

(6) All storage piles shall be oriented so as to minimize wind disturbance.

Since several of these control measures require maintenance activities, ASARCO shall maintain records of the application and reapplication of the binder to the concentrate piles and of the spraying of internal plant roads. The overall control efficiency from the implementation of these control measures is estimated to be 70 percent. This estimate is well supported and attested by literature which estimates 90-100 percent control from

encrusting piles, 50-60 percent from road wetting, 60-80 percent from wind screens, and 50-70 percent from pile orientation. Since several of these control techniques will be used in combination, the 70 percent figure used is conservative.

The control measures specified in items (3), (4), (5) and (6) above shall be completed by December 31, 1983. The practices identified in items (1) and (2) above, including appropriate recordkeeping, shall be initiated by December 31, 1983.

C. Blast Furnace

(1) ASARCO shall install and have operational a controlled air system (tuyere) on its No. 1 blast furnace by December 31, 1983. A similar type of automatic control system presently installed on the No. 3 blast furnace has resulted in a very significant reduction of blast furnace upsets. The controlled air system went into operation in the summer of 1982. There are only the two blast furnaces, No. 1 and No. 3.

(2) The outdoor sinter stockpile will be enclosed and ventilated. In addition the enclosed and ventilated area shall include all transfer belts leading to the sinter stockpile area. This shall also include an improvement in the present charge car area ventilation. Engineering plans (final control plan) for this modification shall be submitted by March 1, 1984. Construction shall begin no later than July 1, 1984, and construction contracts or purchase orders will be awarded for the entire project by March 31, 1985. Construction shall be completed by September 1, 1985. Final compliance will be achieved by December 31, 1985.

(3) The open area (top) of both blast furnaces shall be ventilated to either the existing or a new baghouse depending on volume requirements. Preliminary engineering plans for this ventilation system (final control plan) shall be presented to the State Air Quality Bureau no later than July 1, 1984. Construction plans with increments for each phase shall be completed by March 1, 1985, and final compliance with this section will be achieved on or before December 31, 1986. In the event that the results of the monitoring and CMB analysis show that the blast furnace ventilation system is inappropriate (as per the Memorandum of Agreement, attached) this provision (3) shall no longer be of any force or effect.

The overall control efficiency from the implementation of the blast furnace system (tuyere) and enclosure/ventilation of the sinter stockpile area control measures is estimated to be 70 percent. The installation of a ventilation system on the two blast furnaces is estimated to result in an overall control efficiency of 95 percent.

D. Zinc Oxide Material

Currently the zinc oxide system is inoperative and may remain so for some time; however, in the event that it does resume operations, the following changes and construction will be required before commencement of operations:

The present loading and handling of zinc oxide material into railroad cars shall be enclosed. Further, the car loading system shall have an operational vacuum control system similar to that utilized by the cement industry. Engineering plans shall be submitted to the Department no later than 60 days prior to commencement of construction. These measures are estimated to result in a control percentage of 90.

E. Dross Plant

The dross building has had improvements internally beginning in 1981 until the present. ASARCO has made improvements in: (1) improved ventilation system for the dross kettles; (2) Two additional dross kettle covers; (3) a new matte bin and dumping system; (4) ventilation system for the dross furnace #6 lead kettle; (5) ventilation system for speiss tap hole and launder.

Table 5-L-3 indicates that the dross building emissions were only 1 to 5 percent of the total ambient lead emissions at the various monitoring sites. Therefore, based on the above improvements, no further reductions are considered necessary at this time for the dross building. Table 5-L-4 indicates a 50 percent reduction in lead emissions from this source.

F. Vehicle Exhaust

In August of 1978, EPA published Supplementary Guidelines for lead implementation plans.* This document includes tables setting forth values for probable pooled average lead content of gasoline and for average fleet fuel

* A proposed revision to this document, proposing revised motor vehicle lead emissions projections, was drafted by EPA in March 1983. Since the draft has not yet been finalized, calculations in this SIP are based on the 1978 EPA Guidelines. Concentrations of vehicle exhaust lead in 1987 would be slightly higher using calculations based on the March 1983 draft rather than the 1978 EPA Guidelines. However, this slight increase would not invalidate the overall demonstration of attainment for each of the three quarterly averages addressed in Table 5-L-4. Moreover, use of the 1978 EPA assumptions is proper since other sources should not be penalized due to any delays in the federal government's gasoline lead phasedown program.

economy for specific years from 1974 through 1990. Based upon this information, it is possible to quantify the amount of lead from vehicle exhaust contributed to the monitors as of the lead SIP attainment date. Because the Montana SIP is likely to be finally approved in 1984, a date of mid-1987 is assumed as the attainment date in order to meet the requirement of attainment within three years of EPA approval.

The NEA study shows the highest concentration of lead from vehicle exhaust to be .23 ug/m^3 at the Firehall site. This value was derived in early 1981. The EPA table showing probable pooled average lead content of gasoline indicates that, using 1974 as the base year, by 1981 the lead content had declined by 75 percent. Therefore, .23 ug/m^3 represents 25 percent of the 1974 baseline level. This would indicate a value of .92 ug/m^3 in the vicinity of Firehall in 1974. The EPA table also indicates that, by mid-1987, 95 percent of the 1974 baseline lead content will have been removed from gasoline. Applying this percentage to the .92 ug/m^3 baseline value for Firehall, by mid-1987 the quantity of lead attributable to vehicle exhaust remaining in the vicinity of Firehall would be .046 ug/m^3.

The .046 ug/m^3 value takes into account the reduction in lead content of gasoline, but does not consider reductions due to improvements in average fleet fuel economy. Based upon the EPA table for average fleet fuel economy, the fuel economy for the baseline year of 1974 is approximately 50 percent of the level achieved by mid-1987. Therefore, an additional 50 percent reduction in remaining lead from vehicle exhaust (from the baseline year to the mid-1987 attainment date) needs to be considered. Applying this factor to the .046 ug/m^3 value previously derived, the actual remaining lead from vehicle exhaust at Firehall by the mid-1987 attainment date should be .023 ug/m^3. This represents a control percentage from the 1981 levels of 90 percent. This same control percentage applies to the attainment demonstration for the 4th quarter 1981 Hastie and Hadfield values.

7. Resources

The Montana Department of Health and Environmental Sciences has the necessary resources and manpower to implement the control strategy required to attain and maintain the ambient lead standard. A summary of these resources is presented below:

Full-time employee eqivalents:	16.5
Federal Contribution	$550,000 (1983)
State Contribution	$293,787 (1984)

8. Authority

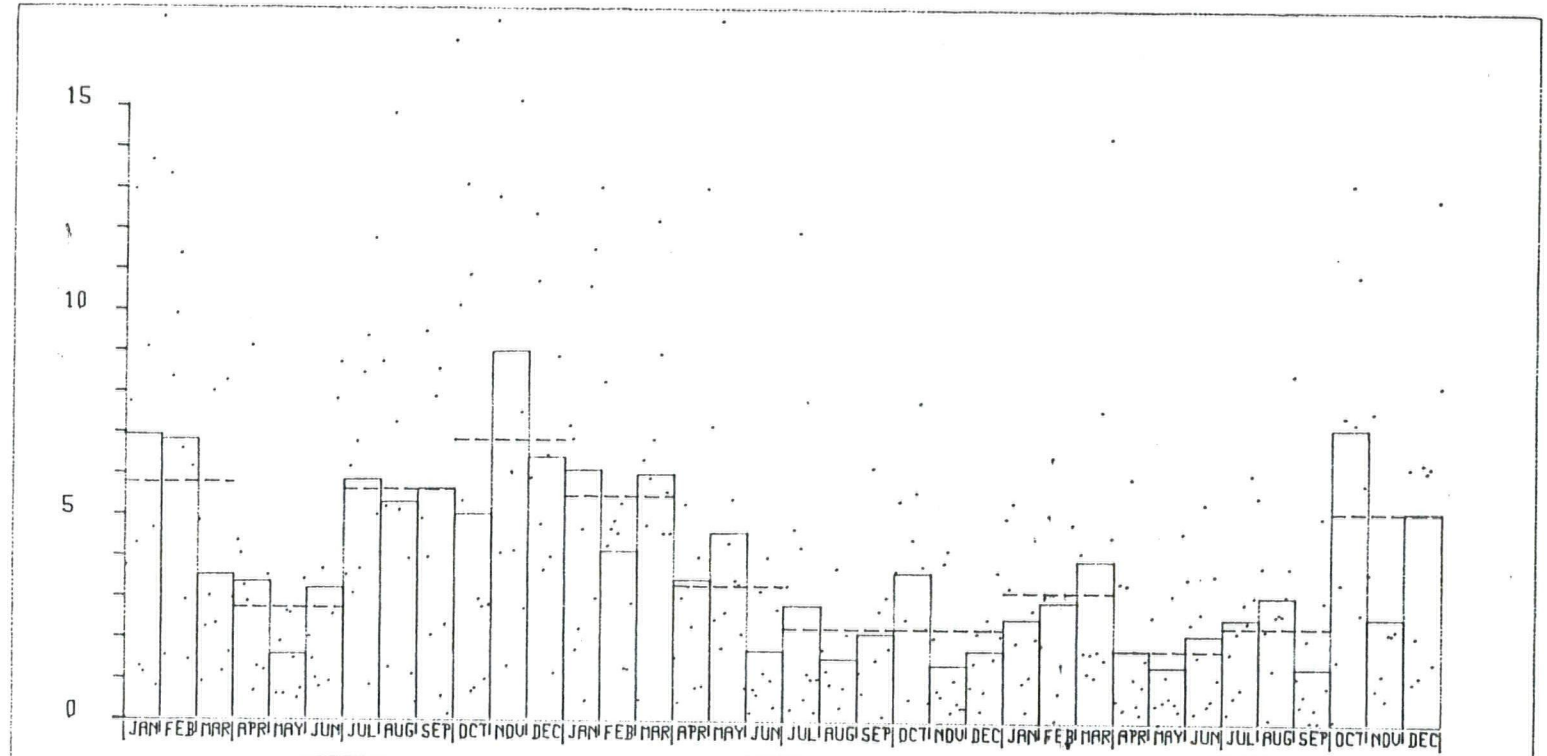
Legal authority for the implementation of this plan is established by the Montana Codes Annotated (MCA), Title 75, Chapter 2. This statute is commonly referred to as the Montana Clean Air Act. Specifically, the Board of Health and Environmental Sciences shall "issue orders necessary to effectuate the purposes of this chapter" (75-2-111(3)MCA). The Department is given the responsibility under 75-2-112(a) MCA to enforce orders issued by the Board.

If a violation of a Board order exists, the Department may issue a Notice of Violation and an Order to Take Corrective Action, require the alleged violator to appear before the Board to answer the charges complained of, seek criminal penalties, or seek civil penalties (75-2-401 MCA). The civil penalties allowed by the Act may not exceed $10,000 for each day of violation. Criminal penalties may not exceed $1,000 per day.

The Board adopted this plan on September 16, 1983 after due notice and a public hearing in accordance with Montana and EPA requirements. This action by the Board makes the Montana lead implementation plan an order enforceable under Montana law. Copies of the applicable Montana statute and regulations have been provided to EPA.

0120980

FIGURE AP-15-I



NUM OBS	11	9	10	9	9	9	10	9	10	10	10	9	10	9	10	10	11	10	10	7	8	10	10	10	9	9	10	10	10	10	11	10	10	10	8	10
MO.AVG	6.9	6.8	3.5	3.3	1.6	3.2	5.8	5.3	5.6	5.0	8.9	6.4	6.1	4.1	6.0	3.4	4.5	1.7	2.8	1.5	2.1	3.6	1.3	1.7	2.5	2.9	3.9	1.7	1.3	2.1	2.5	3.0	1.3	7.1	2.5	5.1
QTR.AVG	5.77			2.74			5.61			6.82			5.46			3.29			2.25			2.26			3.17			1.77			2.33			5.15		

PLOT. . . . . CONCENTRATION VERSUS TIME
METHOD . . . . . HI VOL
UNITS . . . . . MICROGRAMS/CUBIC METER
STANDARDS . . . (FEDERAL) QUARTER - 1.5 UG/CU.M

PARAMETER . . LEAD
AREA. . . . . 0860, LEWIS AND CLARK COUNTY
SITE. . . . . 214, FIREHALL
CITY. . . . . EAST HELENA

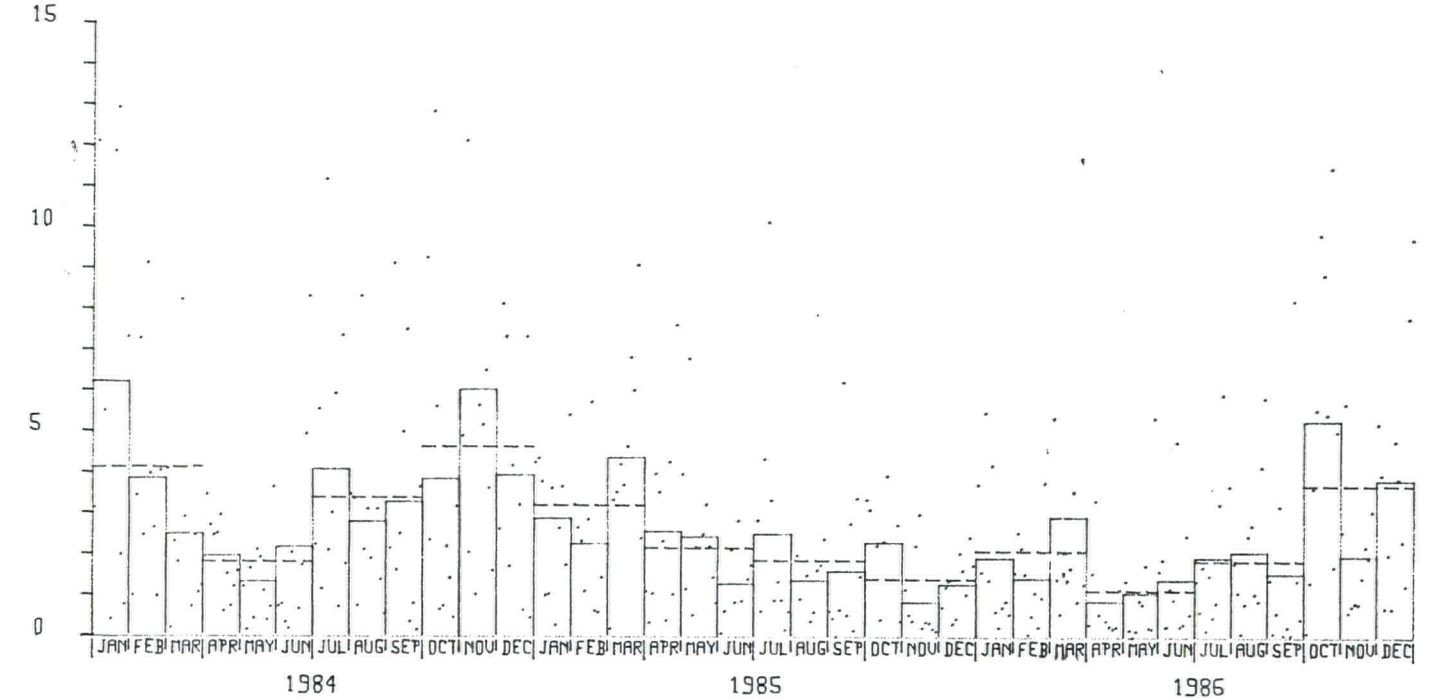
MONTANA STATE AIR QUALITY BUREAU

AUGUST 26, 1987

TECHNICAL SERVICES

0120981

FIGURE AP-16-I



NUM OBS	9	9	10	10	10	9	10	10	10	10	10	9	11	9	10	10	11	8	10	8	10	8	10	10	10	10	10	9	10	10	11	10	10	10	10	11
MO.AVG	6.1	3.8	2.4	1.9	1.3	2.1	4.0	2.8	3.2	3.8	6.0	3.9	2.8	2.2	4.3	2.5	2.4	1.3	2.5	1.3	1.6	2.2	.84	1.2	1.9	1.4	2.9	.88	1.0	1.4	1.9	2.0	1.5	5.2	1.9	3.8
QTR.AVG	4.12			1.82			3.38			4.63			3.19			2.16			1.86			1.41			2.09			1.13			1.86			3.70		

PLOT. . . . . CONCENTRATION VERSUS TIME
METHOD . . . . . HI VOL
UNITS . . . . . MICROGRAMS/CUBIC METER
STANDARDS . . . (FEDERAL) QUARTER - 1.5 UG/CU.M

PARAMETER . . LEAD
AREA. . . . . 0860, LEWIS AND CLARK COUNTY
SITE. . . . . 719, HADFIELD
CITY. . . . . EAST HELENA

MONTANA STATE AIR QUALITY BUREAU

AUGUST 26, 1987

TECHNICAL SERVICES

0120982

DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES

TED SCHWINDEN, GOVERNOR

COGSWELL BUILDING

STATE OF MONTANA

HELENA, MONTANA 59620

STREET SWEEPING SCHEDULES FOR THE CITY OF EAST HELENA AND THE MONTANA DEPARTMENT OF HIGHWAYS

In accordance with paragraphs(3) and (12) of part A, section 6, Control Strategy and Compliance Schedule of the Montana Air Quality Implementation Plan for Control of Lead, attached as Appendix A to the September 16, 1983, Order of the Montana Board of Health and Environmental Sciences; the Department hereby specifies the following schedules for street sweeping and flushing to be carried out by the City of East Helena and the Montana Department of Highways.

City of East Helena

The City of East Helena shall sweep and flush the streets indicated in yellow on Map A, copy attached, on a schedule of at least once per month, except for those months during the winter in which a solid snow pack or continuously freezing weather are experienced.

Montana Department of Highways

The Montana Department of Highways shall sweep and flush the streets indicated in yellow on Map B, copy attached, on a schedule of at least once every ten days except for periods during the winter in which a solid snow pack or continuously freezing weather are experienced.

A short section of Montana Avenue is included here although the Montana Department of Highways has no formal responsibility for this street.

The Montana Department of Health and Environmental Sciences reserves the right to revise these schedules if future sampling information indicates the need for greater control of road dust emissions. The City of East Helena and the Montana Department of Highways hereby acknowledge receipt of and agree to the sweeping schedules specified herein.

Dated this 19th day of June, 1984

City of East Helena

Dated this 18th day of May, 1984

Montana Department of Highways

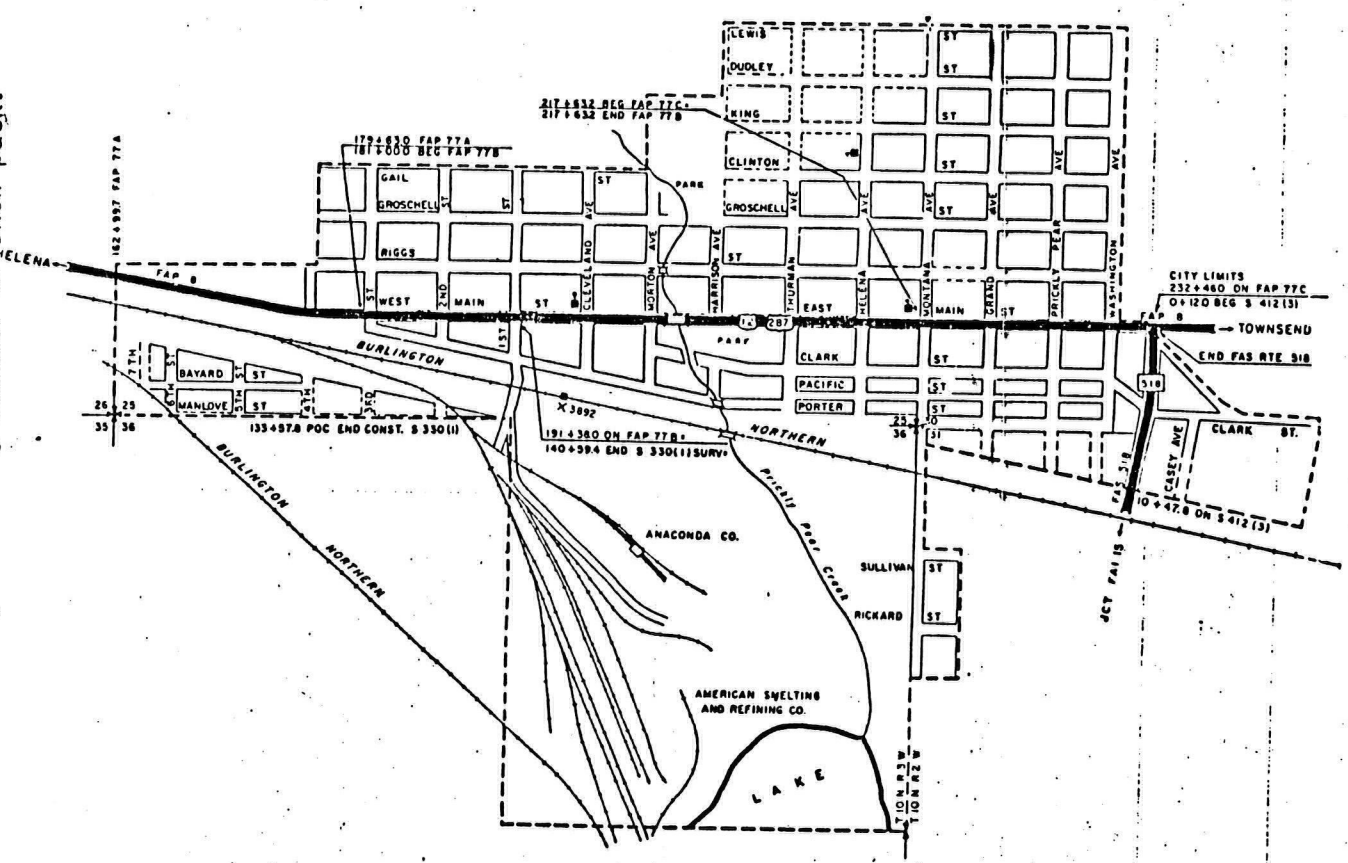
WN/war-8

0120984

MAP A

City of East Helena to flush and sweep streets indicated in yellow once per month except when prevented by continuously freezing weather or snow pack.

Copies of this map are available for a nominal cost at the Montana Department of Highways—Helena, Montana 59601



LEGEND

- PROPOSED ROAD
- GRADED AND DRAINED ROAD
- GRAVEL OR STONE ROAD
- LOW TYPE BITUMINOUS ROAD
- PAVED ROAD
- DIVIDED ROAD - TRAFFIC FLOW
- FAI FEDERAL AID INTERSTATE SYSTEM
- FAP FEDERAL AID PRIMARY SYSTEM
- FAS FEDERAL AID SECONDARY SYSTEM
- (90) INTERSTATE ROUTE MARKER
- (10) U S NUMBERED ROUTE MARKER
- (13) STATE ROUTE MARKER
- (382) OTHER ROUTE MARKER
- CORPORATE BOUNDARY LINE
- NON-EXISTENT DEDICATED STREET
- CENTRAL BUSINESS DISTRICT
- URBAN EXTENSION BOUNDARY
- RAILROAD AND STATION
- POST OFFICE
- COURT HOUSE
- ELEMENTARY SCHOOL
- HIGH SCHOOL
- HOSPITAL
- X 0000 ELEVATION

N

T 10N R 2&3W

CITY PLAT

EAST HELENA

LEWIS & CLARK COUNTY

MONTANA

1970 CENSUS 1,651

SCALE IN FEET

600 0 600 1200

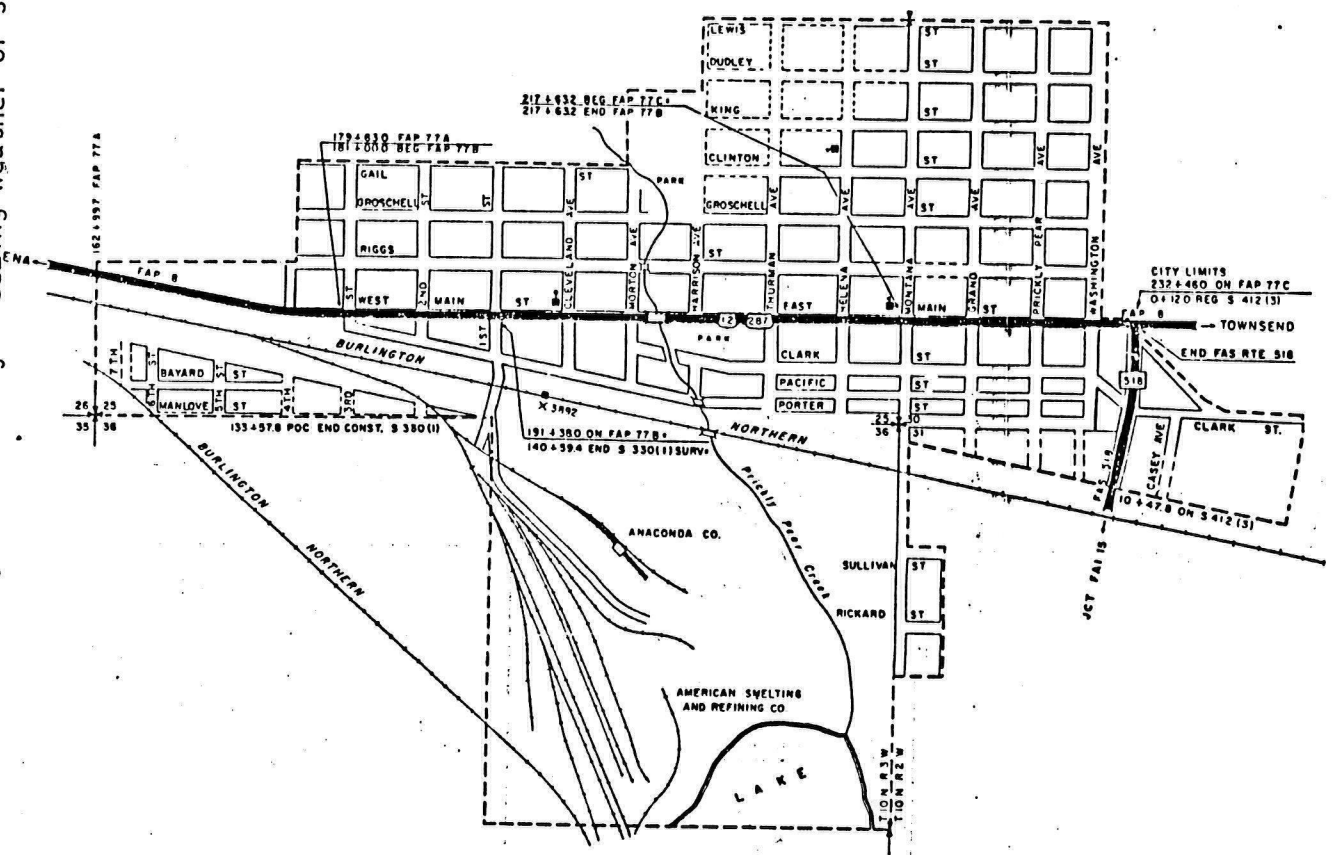
REVISED DEC. 31, 1978

0120985

Copies of this map are available for a nominal cost at the Montana Department of Highways—Helena, Montana 59601

MAP B

Montana Department of Highways to flush and sweep highways and streets indicated in yellow once every ten days except when prevented by continuously freezing weather or snow pack.



LEGEND

- PROPOSED ROAD
- GRADED AND DRAINED ROAD
- GRAVEL OR STONE ROAD
- LOW TYPE BITUMINOUS ROAD
- PAVED ROAD
- DIVIDED ROAD - TRAFFIC FLOW
- FAI FEDERAL AID INTERSTATE SYSTEM
- FAP FEDERAL AID PRIMARY SYSTEM
- FAS FEDERAL AID SECONDARY SYSTEM
- INTERSTATE ROUTE MARKER
- U.S NUMBERED ROUTE MARKER
- STATE ROUTE MARKER
- OTHER ROUTE MARKER
- CORPORATE BOUNDARY LINE
- NON-EXISTENT DEDICATED STREET
- CENTRAL BUSINESS DISTRICT
- URBAN EXTENSION BOUNDARY
- RAILROAD AND STATION
- POST OFFICE
- COURT HOUSE
- ELEMENTARY SCHOOL
- HIGH SCHOOL
- HOSPITAL
- X 3939 ELEVATION

N

T 10N R 2W

CITY PLAT

EAST HELENA

LEWIS & CLARK COUNTY

MONTANA

1970 CENSUS 1,651

SCALE IN FEET

600 0 600 1200

REVISED DEC. 31, 1978